FREE HAND DRAWN SMS – METHOD & DEVICE

INTRODUCTION

This patent is about enabling a handset user to create an SMS message using free hand writing. This patent enables sending an image drawn by the user or also identify the hand writing as characters. Thus, enabling an easy creation of complicated characters such as Chinese characters. This invention also eliminates the complicated use of a small handset keyboard. This invention fits for second generation cellular devices as well as more advanced sets of 2.5G and 3G (third generation). The innovation of this patent is that this invention general and fits all handsets and also is a very low cost solution (several dollars) at each handset. Thus, there is no need to make special major adaptions for various cellular handsets.

FIELD OF INVENTION

This invention is in the mobile handset field. Also, this invention fits into the SMS and EMS (Enhanced SMS) field and Image messaging.

PRIOR ART

Using free hand writing or drawing is popular when speaking about PDAs. Such devices are quite expensive and complicated when compared to a conventional cellular handset (2G –second generation handsets). Other devices fit to cellular handsets but they are special for each handset i.e. these devices are connected to handset's external connector which is proprietary for each handset. Furthermore, existing solutions require attachments external modules that are not small neither cheap.

DISADVANTAGES OF EXSISTING SOLUTION

Existing solutions are not general for every handset neither are they cheap when compared to the cost of a cellular handset. Furthermore, existing solutions require attachments of modules

which are not small if compared to a size of a handset. PDAs do not require any attachments but PDAs can not send free hand drawn images as SMS for second generation of cellular phones. Furthermore, the PDAs are quite expensive when compared to regular second generation cellular handsets. Existing 2G as well as 2.5G phones do not provide a simple way of typing alphanumerical characters. Furthermore, this is even more complicated when far east characters are concerned e.g. Chinese ones.

DESCRIPTION OF THE INVENTION

BLOCK DIAGRAM

Block Diagram 100 – The Handset Side

Block Diagram (100) describes the handset side of the invention. Every GSM handset (30) includes a micro processor (40) which acts as a master micro processor. In addition every cellular GSM handset (30) includes also a SIM card (50). The SIM card also includes a micro processor that acts as a slave micro processor. The master micro processor (40) and the SIM card (50) communicate according to GSM standard 11.11 which is also known as ETSI TS 100 977 document. In fact, this standard is implemented in all GSM ver. 2+ phones and this is the enabling factor of this invention.

According to this standard, it is possible to write and store a short message in the SIM card (50). The Mobile Equipment (ME) which is the cellular handset (30) controlled by its micro processor (40) in this case, can initiate an SMS creation. This invention buffers the communication between the micro processor (40) and the SIM card (50) as far as short messages related communication is concerned. The buffering device is the Intermediate Smart Card (ISC) (80). This device is connected in front of the SIM card (50), by using the SIM connectors (70). The ISC (80) will store, create and provide the micro processor (40) with short messages – instead of the SIM card (50). In fact, the user can use the pad (10) for creating a free hand drawn or written message. This message will be stored within the Intermediate Smart Card (80). The send command will be given by the user by using the handset's (30) keys.

It should be noticed that the pad (10) will be operated by a simple writing device such as a simple pen or pencil (20) that do not need any writing capabilities except the

pressure that they provide on the pad (10). The free hand writing can include text characters or free hand animation or both. The system will include an OCR – a device that recognizes text characters out of hand writing.

Block Diagram 200 – The Structure of the Pad

The pad (10) has a free hand writing area (220). The user can write or draw any object here and in any language he chooses. In order to create a message, the user has to press the create (230) button before he begins drawing or writing. In case the user would like an OCR operation on his drawing / writing, he would have to press the Text Included button (240). The content of the drawing / writing will be stored within the ISC (80), therefore, in order to see this content on handset's display, the user will have to press the Display button (250). When finished with creation of the message to be sent, the user has to store it and therefore he has to press the Message Ready for Sending (260) button. Furthermore, the default language of the OCR will be the language of the handset. Nevertheless if the user would need to send a free hand text message in another language, he can do it by pressing the Language button (270) on the pad (10), and then he would have to specify the language by free hand writing. The pad can be a cheap foil that will be sticked to a handset (30) by a glue attached to it.

Block Diagram 300 – Architecture of the Intermediate Smart Card (ISC)

The ISC has to divide the free hand created message to smaller messages of 160 characters MAX, in order to fit the SMS standard. This quantization will be done within the Quantizator (320) module. There might be a case that the message is still before the recognition of its characters by the OCR (330) that can be placed within the ISC (80) or within the Server (440). In such case or in the case that the message does not include characters at all but only animation, the message should be encoded before quantization and sending. This is done by the encoder module (350). The

server (440) will read and decode this message and also will be able to run OCR on it (in case the OCR is located within the server (440).

The ISC (80) also includes a memory module (340) that stores all SMS created and received. In fact, when the micro processor (40) of the handset (30) is looking for, writing or reading an SMS from the SIM card (50), it will get it from the memory module (340) of the ISC (80). In order to make the ISC (80) cheaper and simpler, the OCR module (320) can be omitted from the ISC (80) and placed at the server (440). The ISC (80) will be a very thin card that will be able to be placed in the space between the battery and the handset (30) in a way that will suit the very majority of handsets. The free hand content should be in a resolution that fits the display of the cellular handset (30) or in a way that will fit the lowest resolution of popular phones – in order to assure interoperability with most GSM existing phones.

When the handset (30) receives a message from the Free Hand Messaging server (440) the message can be encoded. Therefore, the ISC (80) includes a decoding module (360). If a regular SMS is received the ISC (80) wont be involved in a substantial way, though it might provide storage for it instead of the SIM card (50), so that the memory could be enlarged.

Block Diagram 400 – Integration within the Cellular Network

In fact, in order to enable this service of free hand created SMS and other features such as free hand animation messages or picture messages, a server (440) should be added to the SMSC (430). Such server will provide OCR services to messages, will have OCRs in many languages, etc. The architecture presented here includes basic elements of the GSM network: Base station (450) that does the radio communication with the handsets (30), MSC (420) that is the switching device, the SMSC (430) that is the server that provides the SMS services and the innovative Free Hand Messaging Server (440) that will be connected to the SMSC.

Block Diagram 500 – The Structure of the Free Hand Messaging Server

The Free Hand Messaging Server (440) includes the OCR module (520). This module can identify characters drawn by free hand and sent encoded to the server (440). This server can decode the messages by using the decoding module (540). The server (440) also includes an interface module (510) to SMSC. This module is responsible for the communication with the SMSC server. In case that the free hand messaging server (440) has to send a large message that includes more than one 160 character based message, the server (440) includes a concatenation module that will provide the SMSC with concatenated messaging that have to be sent as one. This will be important especially with the EMS (Enhanced SMS) service.

THE PROCESS

Flow charts (1000) & (2000) describe the process of the invention.

The Process - MO (Mobile Originated)- 1000

The user activates Messages Creation Menu on his cellular phone (30) **(1020).**
The handset (30) is waiting for message creation in order to store it in the SIM card (50) or send it via the cellular network (410) **(1030).**
The user presses the Create button (230) on the pad (10) in order to begin drawing or writing a message **(1040).**
In order to tell the system that it should look for a text in the free hand message, the user should press the Text Included (240) button on the pad (10) **(1050).**
The user enters a free hand drawing or writing by using the pad (10) **(1060).**
When finished drawing / writing the message the user can press the Message Ready for sending button (260) in order to notify the ISC (80) that it can store this message as a ready one **(1070).**
When message defined as a ready message (1070), the user can press the display button (250) in order to see his drawing on the display of the handset (30) **(1080).**

When message defined as a ready message (1070), the user can specify a different language for the text he has entered. This should be done by pressing the Language button (270) on the pad (10). This means that the system will try to identify the text characters by using a dedicated OCR to the language that was specified by the user. The default language is the language that the handset (30) was configured to work in **(1090).**

The created message can go through OCR that optionally can be located within the ISC (80) or later in the server (440). If the OCR is located within the server (440) then a notice about the language of the message should be provided to the server (440) encoded within the message **(1100).**

In case the message is not going through OCR in the ISC (80), the message should be encoded and quantified into MAX size of 160 characters. This will be done in the ISC (80) **(1110).**

These Quantified messages should be given a tag of messages that should be sent. Such tag will be understood by the microprocessor of the handset (30) in order to send them in a concatenated way **(1120).**

The user should initiate the sending of the message he has created by entering the send message menu on his handset device (30). He will see new ready message waiting to be sent. This is because the ISC (80) has provided the microprocessor (40) with this information.

Now the user should press send message in the menu mentioned above **(1130).**

The message will be sent to the messaging server - the SMSC (430) which will forward it to the Free Hand Messaging Server (440). There, the message will be decoded, OCR (optional) checked and forwarded back to the SMSC (430) for forwarding it further to its destination **(1140).**

The Process - MT (Mobile Terminated) - 2000

A Short Message (SMS) has arrived to the cellular handset **(2010).**

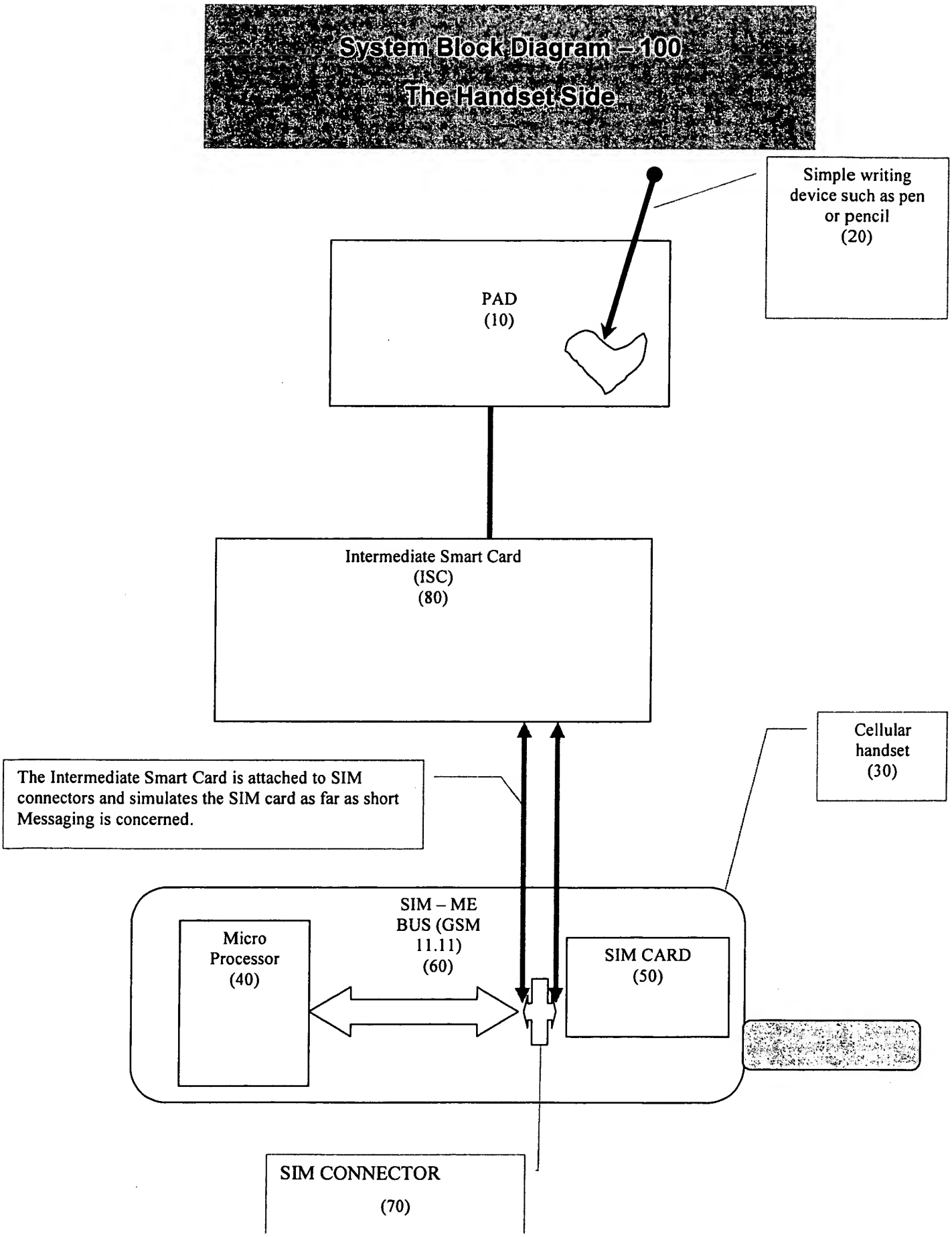
The message normally will be sent to the SIM card (50) for storage, However, in this case because of the ISC (80) that is located between the micro processor and the SIM (50) card, the message will be moved to the ISC (80) while the microprocessor (40) 'thinks' the message has been sent to the SIM card (50) for storage **(2020).**

The ISC (80) will decode the message it has received from the Free Hand Messaging Server (440). In case the message was a regular SMS the ISC (80) wont be involved. However, it might provide storage for it instead of the SIM card (50) memory – so that the total available memory in the handset could be enlarged **(2030).**
The messages received and stored within the ISC (80) can be accessed by pressing relevant keys is the handset as if a received SMS message should be read. The user is free to decide to see the received message **(2040).**

INOVATIVE STEPS

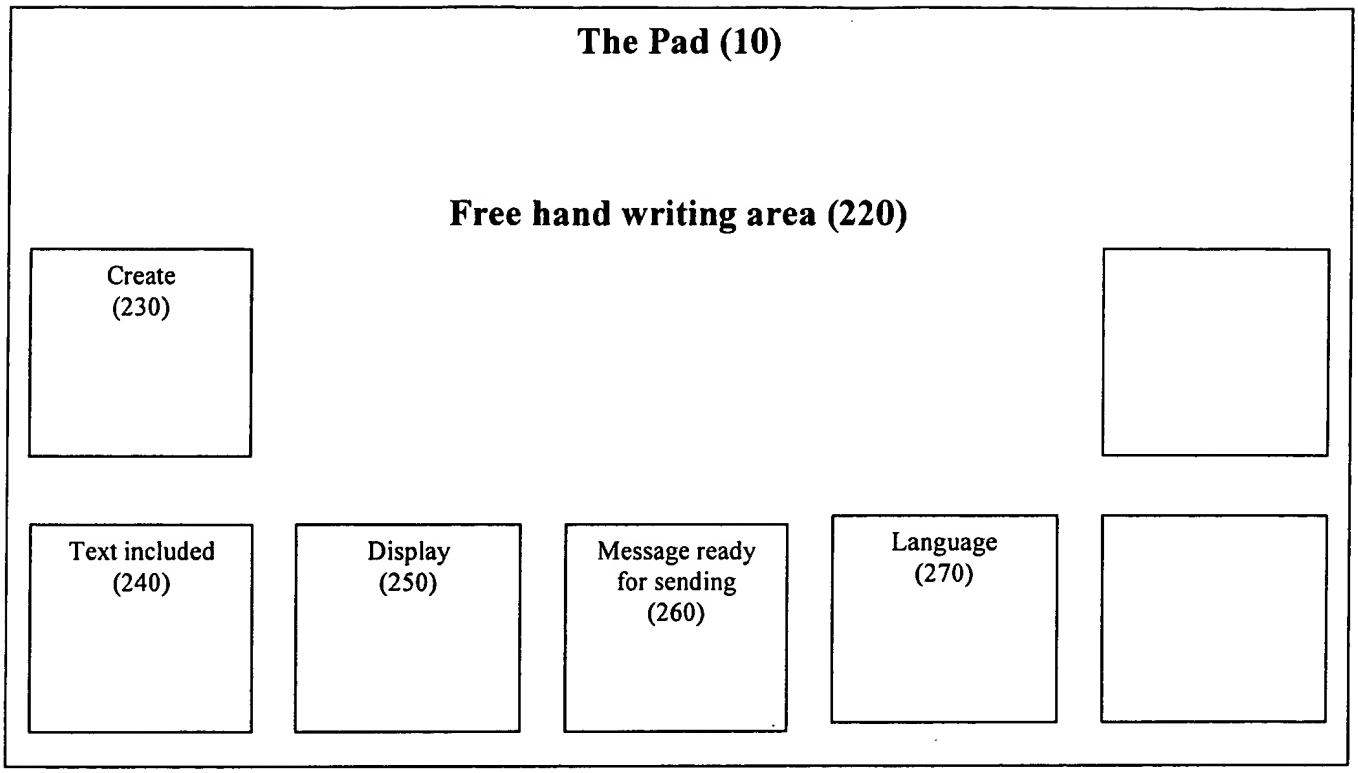
- This invention includes new method and device for free hand SMS drawing or writing.
- This invention is aiming to the common base that unifies all GSM handsets – the SIM card and the access to it. This is the innovative step taken to insure independency of handsets proprietary features.
- This invention enables to divide a bitmap (or other format) image into few 160 character based SMS while sending them to a SMS server that will use an OCR recover the characters.
- This invention uses a small PAD that can be easily glued to a handset and will enable free hand drawing or writing input.
- This invention involves a substantially low cost solution at the handset side for free hand SMS.
- This invention enables to create an SMS that includes text and animation written / drawn by a free hand.
- This invention enables picture messaging with handset independency.

DESCRIPTION of the INVENTION (DRAWING)



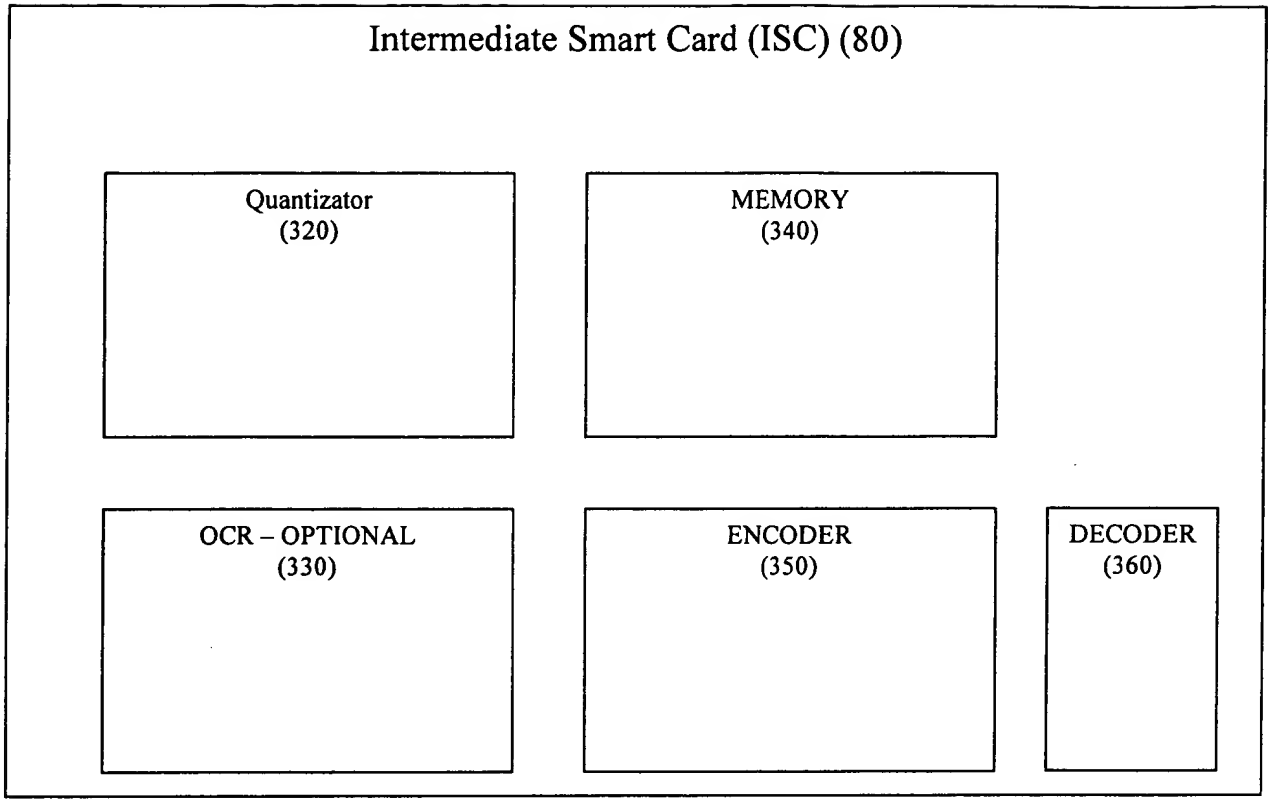
System Block Diagram – 200

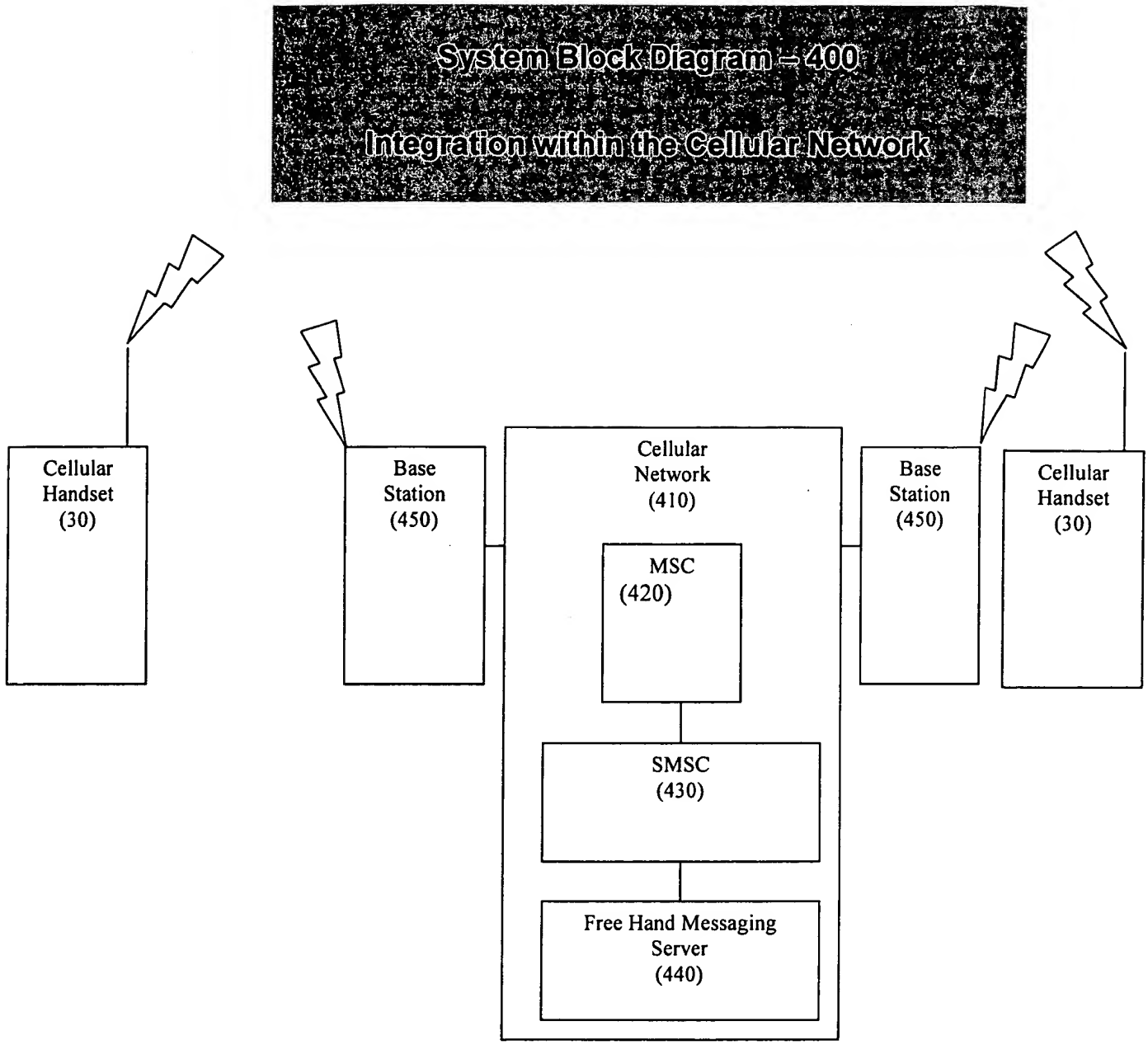
The structure of the Pad

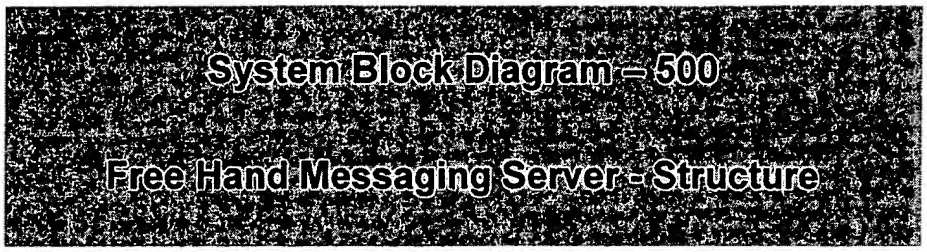


System Block Diagram – 300

Structure of the Intermediate Smart Card (ISC)




System Block Diagram – 400
Integration within the Cellular Network
Cellular Handset (30)
Base Station (450)
Cellular Network (410)
MSC (420)
SMSC (430)
Free Hand Messaging Server (440)
Base Station (450)
Cellular Handset (30)



Free Hand Messaging Server (440)

SMSC INTERFACE (510)
OCR (520)
CONCATENATION MODULE (530)
DECODING MODULE (540)

HERE THE FLOW CHART DOCUMENT SHOULD BE ADDED